

# 1966 IEEE REGION SIX ANNUAL CONFERENCE

APRIL 26 thru 28, 1966

The Institute of Electrical and Electronic Engineers 1966 Region Six Annual Conference will be held at the Pioneer International Hotel, Tucson, Arizona, on April 26-28 (Tuesday through Thursday). The conference will be co-hosted by the Tucson and Fort Huachuca Sections of the IEEE. The theme for this conference is "Future Engineering for Earth and Space". The conference will feature an exceptional program of technical papers and invited speakers.

Luncheon and banquet speakers are:

Keynote Luncheon . . . . . *Dr. Richard Bellman* . . . . . University of Southern California  
 Banquet . . . . . *Dean W. L. Everitt* . . . . . University of Illinois  
 Ft. Huachuca Luncheon . . . *Maj. Gen. David P. Gibbs* . . United States Army  
 Awards Luncheon . . . . . *Dr. W. G. Shepherd* . . . . . President, IEEE

## SUMMARY SCHEDULE OF TECHNICAL SESSIONS AND CHAIRMEN

	8:30 a.m. - 11:00 a.m.	2:00 - 4:30 p.m.
Tuesday, 26 April 66	A. Circuit Theory, Part I Dr. M. E. Van Valkenburg B. Hybrid Analog Computers Dr. G. A. Korn C. Reliability Mr. Igor Bazovsky D. Nuclear Generation of Power Dr. N. Hilberry	E. Circuit Theory, Part II Dr. B. R. Myers F. Computer Organization Dr. H. G. Kolsky G. Communication Systems Dr. J. C. Hancock H. High Voltage D.C. Transmission of Powers Dr. E. W. Kimbark
Wednesday 27 April 66	I. System Theory Dr. A. V. Balakrishnan J. Solid State and Gaseous Plasmas Dr. S. J. Buchsbaum K. Engineering Education Dr. S. S. Shamis	L. Information Theory Dr. N. Abramson M. Biomedical Engineering Dr. F. S. Grodins N. Rotating Machinery Dr. E. C. Guilford W. Military Electronics, Part I <sup>(1)</sup> Dr. L. E. Killion (Electromagnetic Compatibility) X. Military Electronics, Part II Mr. J. J. Lamb (Electromagnetic Compatibility)
Thursday 28 April 66	O. Automatic Control Dr. J. A. Aseltine P. Integrated Circuits Dr. D. O. Pederson Q. Electromagnetics Dr. Leopold Felsen R. Basic Sciences Dr. A. Papoulis	S. Optimal Control Dr. G. Leitmann T. Solid State Device Technology Dr. I. A. Lesk U. Propagation of Pulses Dr. J. R. Wait V. Atmospheric Electricity Dr. Marx Brook

(1) Military Electronics Sessions are to be held at Fort Huachuca concurrently. Sessions will start at 1:15 p.m.

One hundred twenty-five (125) papers will be presented under the above sessions. Two sessions on Military Electronics (Electromagnetic Compatibility) will be held at the United States Army Electronic Proving Grounds at Fort Huachuca, a few miles southeast of Tucson, and all other sessions will be held at the headquarters location in Tucson.

Supplementing the technical program will be the Region Six Student Paper Contest. Winners of district paper contests will be competing at the regional level for honors and prizes.

A special technical tour has been arranged at the U. S. Army Electronic Proving Grounds. Technical tours are also planned at one of the Titan ICBM installations and at the Tucson Gas and Electric Company facilities.

This year the conference will not feature exhibits. Recognition of the manufacturers, manufacturers representatives, and other organizations giving their support to this conference will be given through mediums other than exhibits. Hospitality suites have been arranged so that they will not compete with technical sessions.

Throughout the convention, numerous activities will be arranged for the ladies. The ladies are, of course, invited to all luncheons and banquets, including the All Industry Western Dinner.

For advance registration forms or paper abstracts write: 1966 IEEE Region Six Conference  
 P. O. Box 12826  
 Tucson, Arizona 85711



# 1966 IEEE REGION SIX ANNUAL CONFERENCE

## TECHNICAL PROGRAM

8:30 A.M. - 11:00 A.M.

2:00 P.M. - 4:30 P.M.

### TUESDAY MORNING, APRIL 26, 1966

#### Session A - Circuit Theory (Part 1) - Chairman Van Valkenburg

##### Room 1

Wohlers On a Realizability Theory for Nonuniform Lossless Transmission Lines  
Thomas, Haddad Some Aspects of Zero-Memory Nonlinear Filtering  
Stiljek Analysis of Asymmetrical Nonlinear Oscillations in the Parameter Plane  
Hakim Recent Progress and New Problems in Applied Graph Theory  
Van Valkenburg Multiparameter Sensitivity in Network Synthesis

#### Session B - Hybrid & Analog Computers - Chairman Korn

##### Room 2

Riotte Analog & Hybrid Studies at CETIS  
Potash, Esprin A Rapid Function Evaluator  
Howe Dynamic Error Analysis of Hybrid Computer Systems Using Z-Transforms  
Maybach Optimal Control by Pontryagin on Hybrid Computer

#### Session C - Reliability - Chairman Bazovsky

##### Room 3

Althaus The SESIAC, A New Tool for Statistical Simulation  
Line, Meyer, Ostle Test Program Review  
Zak The Reliability and Maintainability (RAM) Interface  
Moore Elements of Redundancy  
Monroe Selection of Reliability Analysis Techniques

#### Session D - Nuclear Generation of Power - Chairman Nilberry

##### Room 4

Pittman Central Station Power from Fission Fuels  
Slagel Nuclear Reactors for Remote Service  
Sennett Isotopic Power Sources  
Pidd The Prospects for Direct Conversion

### TUESDAY AFTERNOON, APRIL 26, 1966

#### Session E - Circuit Theory (Part 2) - Chairman Myers

##### Room 1

Geffe Self-Equalized All-Pass Networks  
Kervin An Active AC Reluctance Function Filter  
Celahan, Graham Synthesis of Time - Varying Active Networks  
McDermott, Gupta Realizable Regions for Feedback Circuits  
Hendrick Utilization of Cut-sets and Tie-sets for Circuit Design

#### Session F - Computer Organization - Chairman Kolsky

##### Room 2

Kolsky Computer Organization--A Survey of Current Trends and Problems  
Hastings Automatic Detection and Correction of Errors in Digital Computers Using Residue Arithmetic  
Watson Theoretical Foundations for Reliable Machine Design Using a Redundant Residue Number System Code  
Adahl Simulation Studies of Time-Sharing Techniques

#### Session G - Communication Systems - Chairman Hancock

##### Room 3

Nabours, Schultz Adaptive Filter Design for Optimum Detection of Signals in Nonstationary Channels  
Schwitters, Nabours Optimal Time-Invariant Filter Design for Nonstationary Communication Systems  
Totty Sensitivity of Matched Filter Design for Communications Systems  
Amin Random Multiple Access to a Peak Power Limited Channel Using Pseudo-Noise-Carriers  
Hunt Midpath Airplane Interference to Digital Transmission in Tropospheric Radio

#### Session H - High Voltage DC Transmission of Power - Chairman Kimbark

##### Room 4

Kaiser, Cerdner HV DC Transmission: Mercury Valves - Thyristors  
Lamm Mercury-arc Valves for High-Voltage DC Transmission  
Cehrig, Effording Insulation Coordination of HV DC Transmission Lines

### WEDNESDAY MORNING, APRIL 27, 1966

#### Session I - System Theory - Chairman Balakrishnan

##### Room 1

Balakrishnan State Space Theory of Continuous Systems  
Drenick System Theory - A View of its Present State and Future  
Rucy Linear Positive Machines  
Kleinrock Theory of Queues and Time-Shared Computer Systems  
Harrison Input-Output Relations and Sequential Systems

#### Session J - Solid State and Gaseous Plasmas - Chairman Buchsbaum

##### Room 2

Wolff Waves in Solid State Plasmas  
Ancker-Johnson Instabilities in Solid-State Plasmas  
Carlisle With What Precision Can Surface Waves be Used to Measure Electron Density?  
McNelis Propagation and Radiation in Moving Media  
Reahle Theory and Analysis of the Cylindrical Induction Type Magnetohydrodynamic A. C. Power Converters

#### Session K - Engineering Education - Chairman Shamsi

##### Room 3

Beakley, Price Motivating Engineering Freshmen Through an Authentic Design Experience  
Perden, Dorf Systems Engineering--A Structure for an Integrated Degree Program  
Thompson, Thompson The Design of an Engineering-Based Computer Science Curriculum  
Adams A Digital Logic Laboratory for the Teaching of Switching Systems  
Steele Educating the Working Engineer  
Koufale Invest in the Future of Young Electric Utility Engineers  
Erdelyi, Bernes

### WEDNESDAY AFTERNOON, APRIL 27, 1966

#### Session L - Information Theory - Chairman Abramson

##### Room 1

Huffman Planning Computer and Information Sciences Curricula  
Hsia On the Identification of Discrete-Time Systems  
Spragins Property Transformations to Simplify Pattern Recognition Systems  
Silber Probability of False Alarm for Noise with Amplitude Limiting of Arbitrary Hardness  
Kallath Coordinate-Free Methods for Detection Problems

#### Session M - Biomedical Engineering - Chairman Crodins

##### Room 2

Mericle, Balm, Barker An Automatic System for Classification of Electrocardiograms  
Custafson, Staples, Townsend A Low Cost Electrocardiographic Measurement System  
Custafson, Mericle A Preliminary Dynamic Model for Adrenocortical Response to ACTH  
Urquhart, Li Determining Electric Current Flow Patterns in the Thorax  
Montgomery Digital Computer Simulation Studies of Renal Function  
Kinnen Some Relationships Between the Estimation of Respiratory Response and Elementary Modulation Theory  
Horgen, Heade Mechanical Contributions to the Frequency of Hand and Finger Tremor in Man  
Yamamoto Limitations on the Equivalent Cardiac Generator  
Stiles, Randall  
Flonsey

#### Session N - Rotating Machinery - Chairman Guilford

##### Room 3

Townsend, Erdelyi Pole Tip Saturation Effects in a Large Compensated D. C. Machine  
Massaro, Jackson, Erdelyi Flux Distribution in Large Turbo-Generators On-Load  
Hanna, Gish Saturated Subtransient Reactances in Salient-Pole Synchronous Machines  
Wilson, Erdelyi Three-Dimensional Theory of Solid Rotor Induction Motors  
Hopkins Some Unconventional Applications of Induction Machines

#### (1) Session W - Military Electronics (Part 1) - Chairman Kilian (Electromagnetic Compatibility)

##### Fort Huachuca

Levachik Electromagnetic Compatibility of Future Military Satellite and Ground Based Systems Operating in the Same Frequency Band  
Loveberg Electromagnetic Compatibility Considerations in Ship Communications Systems  
Kraevitz A Probabilistic Prediction Model  
Mayher Basic Performance Thresholds  
Stiles, Lung, Woodfill Electromagnetic Compatibility Test and Evaluation by the U. S. Army  
Permer Capabilities and Applications of the Electromagnetic Environmental Test Facility (EMET) Interference Prediction Model  
Thompson Articulation Index as a Predictor of Voice Communication Link Performance in RTI Environment  
McEachen Frequency Allocation Assistance by Computer Techniques

#### (1) Session X - Military Electronics (Part 2) - Chairman Lamb (Electromagnetic Compatibility)

##### Fort Huachuca

Cox, Petock Voltage Transient Tests for EMP Evaluation  
Lamb, Morrison Impulse Interference Correlation and Excision to Prevent Errors in Data Acquisition  
Ordonez Spectrum Signatures in the Electromagnetic Compatibility Program  
Lunell Technical Problems and Some Solutions in Spectrum Signature Data Collection  
Case Exploratory Research in the Spectrum Signature Program at the U. S. Army Electronic Proving Ground  
Southwick New Instrumentation and Techniques for Spectrum Signature Measurement  
Vidrine A New Method for the Prediction of Amplitudes of Spurious Emissions and Responses  
Steele A Statistical Study Relating Experimental Propagation Losses to Terrain and Other Factors

### THURSDAY MORNING, APRIL 28, 1966

#### Session O - Automatic Control - Chairman Aseltine

##### Room 1

Nabayah Extending the Phase Plane Method to Some High Order Relay Servos  
Sridhar, Pearson Digital Estimation of Nonlinear Processes  
Hutchinson, Monopoli Estimation of States in Systems With Unknown Parameter Variations  
Long, Rutledge, Wallace A Simulation Study of Phase-Locked Loop Dynamics in the Presence of Noise  
Neumann, Sametad Control of Clinker Quality for Cement Plant Applications

#### Session P - Integrated Circuits - Chairman Pederson

##### Room 2

Lin, Davis, Sun Active and Passive Multiplication of RC Time Constants for Subaudio Frequency Integrated Filters  
Solomon, Frederiksen Techniques for Realization of High Performance Linear Integrated Circuits  
Thompson A New High Performance AGC System  
Hilbiter Integrated Oscillators  
Pepper, Pederson

#### Session Q - Electromagnetics - Chairman Felsen

##### Room 3

Cocenas, Tyras Generalization of the Sommerfeld Problem to Arbitrary Media  
Marinos A Study of Slot Antennas Covered With a Dielectric Slab of Arbitrary Thickness  
Weit Radiation from a Spherical Aperture Antenna Immersed in a Compressible Plasma  
Webster, Tyras Field of a Magnetic Line Source in the Presence of a Semicylindrical or Semielliptical Resonator  
Sinhe The Partially Filled Cavity Resonator Techniques for the Evaluation of Permittivity and Permeability of Unannealed Ferrites  
Burns, Devereux The Parabolic Cylindrical Waveguide

#### Session R - Basic Sciences - Chairman Papoulis

##### Room 4

Chen, Bapna A New Approach to the Coates-Desoer Gain Formula  
Tilton Cathode-Ray Scenography  
Lindar Systemic Modeling of Vacuum Diodes  
Burns, Duncan Microwave Cas Breakdown of Helium in a Coaxial Cavity  
Wolters A Stripline Approach to the Microminiaturization of Microwave Circuits

### THURSDAY AFTERNOON, APRIL 28, 1966

#### Session S - Optimal Control - Chairman Leitmann

##### Room 1

Agarwal, Sridhar Design of Specific Optimal Control Systems  
Manci Minimum Fuel Trajectories with Soft Landings  
Pelewonsky Optimal Space Rendezvous and Interception  
Ustin, Duckstein Optimal Control: Some Limitations and Potentialities  
Zadeh

#### Session T - Solid State Device Technology - Chairman Leek

##### Room 2

Kang Transistors with Ideal Current Gain Characteristics at Low Current Levels  
Nblack, Clerk Current Saturation and Drain Impedance in MOS Transistors  
Borin, Wingo Gallium Phosphide Visible Light-Emitting Diodes for Rapid Information Storage on Film  
Metz Physics and Chemistry of Device Failures  
Leek Teaching Transistor Courses

#### Session U - Propagation of Pulses - Chairman Weit

##### Room 3

Crombie Multimode Propagation in the Earth-Ionosphere Waveguide  
Taylor A New Spectrum Analysis Technique for Using Atmospherics to Determine VLF Attenuation Rates  
Doherty, Large A New Technique for Studying Low Frequency Pulse Propagation  
Johler Propagation of an Electromagnetic Pulse of Nuclear Origin  
Knop Pulsed Propagation in Dispersive Media

#### Session V - Atmospheric Electricity - Chairman Brook

##### Room 4

Uman Lightning Properties from Lightning Spectroscopy  
Evans, Wagner Pre-Stroke Radiation from Thunderclouds  
Seleneve Inferred Spectra of Lightning  
Vonnegut, Espinola Electric Potential Gradients Above Thunderstorms  
Blau, Little, Moore Preliminary Results of Cross-Polarized Radar Studies of Clouds  
Brook, Mendez

(1) Military Electronics Sessions are to be held at Fort Huachuca concurrently. Sessions will start at 1:15 p.m.